MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Area: Beaufort Sea

Title: Aerial Photography of Bowhead Whales to Estimate the Size of the Bering-Chukchi-Beaufort Population (AK-04-05)

MMS Information Needs to be Addressed: Information from the study will be used for ESA and NEPA analysis and documentation for Beaufort Sea Lease Sales and DPPs.

Total Cost: $166,000 **Period of Performance:** FY 2004-2007

Conducting Organization: NMFS, NSB

MMS Contact: Chief, Alaska Environmental Studies Section

Description:

Background An aerial photographic survey of bowhead whales was conducted during the spring of 2003 based out of Barrow, Alaska. This survey was very successful with >750 photographs having been obtained. Analysis of the photographs is expected to be useful toward an improved population size estimate using mark and recapture methods. This project is envisioned as a jointly funded effort, including but not limited to NMFS, NSB, and MMS. Additional funding sources may be involved as needed to seek additional population dynamics information.

Biological information about the status of endangered bowhead whale stocks is useful for OCS management and to maintenance of the centuries-old subsistence lifestyle along the north coast of Alaska. Two of the most important statistics are current population size and population trends. Population estimates are typically generated via ice-based censuses at Barrow; however, few (if any) data exist to confirm the apparent population increases indicated by these counts. Credible confirmation of population size would help evaluate whether the Bering-Chukchi-Beaufort bowhead whale population should be down-listed to the threatened species list. Other life history parameters (migration timing, etc) obtained from the study would likewise be useful for management of offshore activities.

Objectives The primary goal of the survey is to estimate the size of the bowhead whale population using photogrammetric mark-recapture methods and data collected during 2003 and 2004. Specific objectives for accomplishing this goal include:

1. Conduct an aerial photographic survey of bowhead whales in the spring of 2004.
2. Analyze the 2004 photographs to identify the recurrence of individual whales previously photographed in 2003.
3. Use mark-recapture methods and calculations to estimate the population of bowhead whales.
4. Develop and test a computer program that will increase efficiency of the search for matches among whale images collected in different years.

Methods This jointly-funded study would be conducted using methods already developed in 2003 by NMFS and NSB. Required permits for low-level photography will be obtained as needed. The draft final report to MMS would include full description of the aerial survey protocol, mark-recapture methods used, analysis of collected data, and discussion of findings relative to population estimation. Other ancillary population dynamics parameters obtained on growth rates, survival rates, migration timing, calving intervals and population structure (length-frequency distribution) may be included. The study will develop and test a computer program that will increase the efficiency of the search for matches among whale images collected in different years by prioritizing images for comparison.

Current Status:

Planned research has been completed, and a draft final report submitted and reviewed. The final report is expected to be completed and available during Spring, 2008.

Final Report Due: May 2008

Publications Completed:

Brandon, J. R., J. M. Brewick, A. E. Punt, and P. E. Wade. in press. Alternative resampling schemes for life history parameters used in Bayesian stock assessments of bowhead whales. Journal of Cetacean Research and Management.

Koski, W. R., J. C. George, R. Suydam, D. J. Rugh, A. R. Davis, B. D. Mactavish, J. Brandon, and S. Moore. 2005. An update of aerial photography of bowhead whales conducted during 2003-2005 spring migrations. Paper SC/57/BRG16 to the International Whaling Commission Scientific Committee. 13pp.

J. Brandon and J. Breiwick. 2005. Alternative resampling schemes used in Baysian stock assessments of bowhead whales. Abstract. American Fisheries Society Conference.

Affiliated WWW Sites: http://www.mms.gov/alaska/
http://nmml.afsc.noaa.gov/

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